CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. 99-053

WASTE DISCHARGE REQUIREMENTS
FOR
COUNTY OF SACRAMENTO
PUBLIC WORKS AGENCY
KIEFER LANDFILL
CLASS III LANDFILLS
SACRAMENTO COUNTY

The California Regional Water Quality Control Board, Central Valley Region, (hereafter Board) finds that:

1. The County of Sacramento, Public Works Agency, Waste Management and Recycling Division, (hereafter Discharger) owns and operates the Kiefer Landfill, a Class III solid waste disposal facility. The landfill has been in operation since 1967, accepting municipal solid waste from the Cities of Sacramento, Folsom, Isleton, Galt, and unincorporated areas. On 24 November 1998, the Discharger submitted an application and Report of Waste Discharge (RWD) for revised Waste Discharge Requirements (WDRs), for construction of a new landfill immediately north and east of the existing facility. Previous WDRs Order No. 95-078 did not cover the proposed expansion area.

2. The facility is at the intersection of Grant Line Road and Kiefer Boulevard, in the eastern portion of Sacramento County, about 15 miles east of the City of Sacramento, one mile north of Sloughhouse, and six miles northwest of the City of Rancho Murieta, in Sections 22, 26, 27, 34 and 35, T8N, R7E, MDB&M, as shown on Attachment "A" which is incorporated herein and made part of this Order.

3. The total site area is 1,084 acres and there are two landfills, referred to herein as "Landfill 1", the existing landfill, and "Landfill 2", the expansion landfill, respectively. The existing landfill footprint covers 228 acres and the proposed expansion area will cover an additional 432 acres, a combined total of 60% of the site area. The Assessor's Parcel Numbers are APNs 126-090-16, 17, 18, 19, 20, and 21, and APN 126-090-02 (Landfills 1 and 2).

4. On-site support facilities include the office, scalehouse, access roads, materials recovery and storage areas (ie. for wood, tires, construction materials, appliances etc.), an inert waste processing area, a landfill gas flaring plant, an extracted groundwater treatment plant, pipelines, the active landfill face, and other facilities (see Attachment B, Site Map, which is incorporated herein and made part of this Order).

5. Landfill 1 consists of lined and unlined module phases. Module M1, the original Kiefer Landfill, is unlined and covers about 70% of Landfill 1. M1-L, the lined portion of Landfill 1, is a Subtitle D lateral expansion of the original landfill, covering 67 acres. Landfill 1 has only about three years of capacity remaining to final grade.

6. Landfill 2, the expansion landfill, will be constructed in phases immediately north of Landfill 1 starting in the late summer of 1999, beginning with Module M2. It will include 10 lined modules (M2 through M11), covering 432 acres, as shown on Attachment "B". It is estimated that Landfill 2 will extend the life of the landfill to the year 2035.

7. On 9 October 1991, the United States Environmental Protection Agency (USEPA) promulgated federal municipal solid waste (MSW) regulations under the Resource Conservation and Recovery

Act (RCRA), Subtitle D (Title 40, Code of Federal Regulations, Parts 257 and 258), hereafter referred to as "Subtitle D". These regulations apply to all California Class III and/or Class II landfills which accept MSW, including the Kiefer Landfill.

8. Effective 18 July 1997, the water quality regulations for Class II and Class III disposal facilities formerly contained in Chapter 15, Title 23, California Code of Regulations (CCR), and the solid waste regulations formerly in Title 14, CCR, were re-codified into Chapters 1 through 7, Subdivision 1, Division 2, Title 27, CCR (Title 27). Chapter 15 is therefore no longer applicable to this facility.

WASTES AND THEIR CLASSIFICATION

9. The Discharger proposes to continue to accept municipal solid wastes, commercial and industrial wastes, and special wastes, classified as "inert" or "nonhazardous" under Sections 20220 and 20230 of Title 27. The Discharger does not propose to accept wastes defined as "hazardous" or "designated" under Title 27, and these WDRs contain a prohibition against the disposal of such wastes.

10. The landfill accepts nonhazardous grit and screening wastes (special wastes) from the Sacramento Regional Wastewater Treatment Plant (SRWTP). Liquid wastes, such as landfill leachate and chemical toilet waste, are trucked for disposal at the SRWTP.

SITE DESCRIPTION

11. The area surrounding the site is low rolling Sierra Foothill terrain, with natural elevations varying between 110 and 230 feet MSL. The landfill filled a shallow south-trending valley such that there is natural high ground to the east and west.

12. Surrounding land uses include pasture, livestock grazing, crop growing, and residential.

13. There are 19 private wells within one mile of the site, including at least eight used for irrigation, two for domestic supply, and one for livestock. Numerous additional domestic and irrigation wells are located south of the site along Highway 16 near Sloughhouse.

SURFACE WATER

14. The northern part of the site is in the Franklin/Florin Hydrologic Sub-Areas (HSAs), Morrison Creek Hydrologic Area (HA) of the Valley-American Hydrologic Unit (HU) in the Sacramento Hydrologic Basin Planning Area (as depicted on the interagency hydrologic maps prepared by the Department of Water Resources in August 1986), and is naturally drained by Laguna Creek, a seasonal water tributary to the Sacramento River.

15. The southern portion of the site is in the Lower Deer Creek HSA, Lower Consumnes-Dry Creek HA of the North Valley Floor HU in the San Joaquin River Basin Planning Area, and is naturally drained by Deer Creek, tributary to the Consumnes River, thence the Mokelumne River.

16. The beneficial uses of these surface waters are domestic, municipal, agricultural, groundwater recharge, power generation, recreation, aesthetic enjoyment, fresh water replenishment, fresh water habitat, migration, spawning and preservation and enhancement of fish, wildlife and other aquatic resources.

17. The landfill expansion will impact 4.8 acres of jurisdictional waters of the United States, including reservoirs, vernal pools and wetlands. The Discharger has demonstrated compliance with the requirements of Section 258.12 of Subtitle D as follows:

    a. 40 CFR 258.12 (a) (1) - The Final Supplemental Environmental Impact Report indicates that the project as proposed has been designed to minimize impacts to wetlands and that there are no practicable alternatives to the proposed expansion which would be less damaging of wetlands.

    b. 40 CFR 258.12 (a) (2) (i) & (ii) — The requirements in these WDRs help to ensure that the proposed project will not violate applicable water quality standards relating to the discharge of waste to land. In the event of a release, however, Title 27 provides a script for evaluation monitoring and corrective action to restore groundwater quality objectives. NPDES Permit No. CA0083681 (Order No. 95-025) further requires the Discharger to remove volatile organic components (VOCs) from extracted groundwater to non-detect levels prior to discharge to Deer Creek, minimizing the potential for a violation of surface water quality standards or toxic effluent limitations under Section 307 of the Clean Water Act. The implementation of best management practices required under the General Storm Water Permit for Industrial Activities for landfill operations, and, as applicable, under the General Storm Water Permit for Construction Activities, similarly protects surface waters.

    c. 40 CFR 258.12 (a) (2) (iii) — The Discharger will develop a Habitat Conservation Plan and will apply to the United States Fish and Wildlife Service for an "Incidental Take Permit" under Section 10 of the Endangered Species Act (ESA). These WDRs include a provision requiring the Discharger to obtain any necessary approval from the USFWS prior to initiation of any construction, which could impact protected or endangered species, or their habitat.

    d. 40 CFR 258.12 (a) (3) — The proposed project design, as described in these WDRs, meets the waste containment criteria for a Class III landfill under Title 27, minimizing the potential for a release of solid wastes or leachate which could impact wetlands. The project design also meets the Title 27 requirements for WMU slope and seismic stability, and those for erosion and drainage controls, minimizing the potential for a release of wastes caused by a loss in structural integrity of the WMU, migration of eroded soils or wastes, or migration of waste constituents in drainage. In addition to these factors, the collection of landfill leachate and disposal at an authorized off site facility should be sufficient to minimize the potential for a catastrophic release which could impair fish, wildlife, and other aquatic resources and their habitats.

    e. 40 CFR 258.12 (a) (4) — In addition to minimizing impacts to wetlands, as described above, the Discharger proposes to offset unavoidable impacts to wetlands by creating approximately 7.5 acres of onsite wetlands (a 2:1 ratio), or by purchasing credits from an approved mitigation bank, as described in the FSEIR. To protect and preserve onsite wetlands, including those re-created, the Discharger has proposed a Wetlands Mitigation and Monitoring Program (WMMP), which incorporates the Habitat Conservation Plan required by the USFWS. These WDRs require implementation of the WMMP, including the submission of annual monitoring reports, so as to comply with this section, which incorporates Section 404 of the Clean Water Act. The plan will be implemented prior to and concurrent with construction of the expansion modules.

STORM WATER

18. Storm water run-on, and runoff from the undeveloped area of the site, is captured in an outside perimeter ditch called the "off-site channel". The off-site channel exits the site at Kiefer Boulevard and discharges into Deer Creek.

19. Storm water runoff from the existing landfill is captured in an inner perimeter drainage ditch called the "on-site channel" along the north and east perimeter of Landfill 1. The on-site channel empties into a sedimentation basin at the southeast end of the landfill. The purpose of the sedimentation basin is to retain runoff, allowing for settling of sediments, evaporation, and percolation. Any excess water is then discharged to Deer Creek via the offsite channel.

20. Three new sedimentation basins (A, B and C) will be constructed for the expansion project, as shown in Attachment B, Site Map. Landfill runoff from the new modules will be captured by a perimeter ditch system and discharged into the sedimentation basins for settling prior to discharge to Deer Creek (via an outside channel). Basin B will be constructed after Module 2 when it is no longer possible to route runoff using the existing drainage system. Basin C will be constructed along the southern footprint boundary of Landfill 2 prior to Module 11. The existing sedimentation basin will ultimately be removed to accommodate Module 11. Basin A will be constructed last on the southeast end of the landfill, when Modules 9 and 10 are constructed toward the end of the project.

21. The facility receives about 19 inches of average annual precipitation (as shown by the isohyetal map of normal annual precipitation prepared by the County of Sacramento (1966)), varying from a minimum of about 5 inches in very dry years to a maximum of about 36 inches in very wet years. About 90 percent of the storm events occur between the months of November and April. The mean annual evaporation is 66.9 inches, as measured at Folsom Dam for the years 1956 through 1978. Folsom Dam is 12 miles north of the facility.

22. The 100-year, 24-hour precipitation event for the Sacramento City WSO is 4.39 inches, based on California Department of Water Resources (DWR) precipitation records (1976).

23. A 25 acre portion of the existing landfill, and five acres of the proposed expansion, lie at an elevation of less than 120 feet MSL, the 100-year floodplain elevation for Deer Creek, as designated by the National Flood Insurance Program Map (Panel No. 060262 0250 B; April 21, 1981). It is not known whether this flood level designation is based on a hydrologic study of the Cosumnes River Basin. The highest recorded flood level in the landfill area was 117.65 feet MSL in 1982.

24. Under Subtitle D (40 CFR 258.11), the Discharger must demonstrate that any new or existing MSW landfill located in 100-year floodplain does not (1) restrict the flow of a 100-year flood, (2) reduce the temporary water storage capacity of the floodplain, or (3) result in washout of solid waste so as to pose a hazard to human health and the environment. The owner or operator must place the demonstration in the operating record.

    Staff previously approved this demonstration for the existing landfill based on the following factors:

    (1) the landfill is in the upper portion of the Cosumnes River watershed, and is unlikely to impede flood waters;

(2) the 25 acres of flood plain volume taken up by the existing landfill are offset by the volume of the sedimentation basin, which collects onsite storm water flows;
(3) the landfill is protected from washout by a perimeter access road along the southern edge of the landfill, which serves as a buttress, and a soil berm which rises above 130 feet MSL. The lower half of the southern face has also received final cover, reducing the potential for washout.

For the proposed landfill, the Discharger has further demonstrated:

(1) the landfill is in the upper portion of the Cosumnes River watershed, and is unlikely to impede flood waters;
(2) the volume of the floodplain displaced by the landfill (approximately 168,000 cubic yards) will be offset by excavating an equal volume below the 120-foot MSL elevation; and
(3) The proposed design of expansion Module 10 (the area within the floodplain) includes a buttressing perimeter road and a soil berm which will rise to at least 130 feet MSL.

These WDRs require that the design of any new module comply with the Subtitle D floodplain requirements.

25. The facility has obtained coverage under the General Industrial Storm Water Permit for storm water discharges. The permit applies to direct storm water discharges and storm water discharges from the sedimentation basins.

SITE GEOLOGY

26. Quaternary alluvium, the Laguna Formation, the Mehrten Formation, and the Valley Springs Formation, in that order, underlie the site. These formations dip slightly to the west and are summarized as follows:

- The Quaternary alluvium is confined to an area south of Landfill 1.
- The Laguna Formation is present as a thin gravel layer, which outcrops on the southern part of the site.
- The base of the landfill cuts the Mehrten Formation, which underlies the Laguna, in the southern part of the site. It varies from 300 to 350 feet in thickness and is subdivided into upper and lower units.

- The upper Mehrten is subdivided into three sand sequences (the "shallow", "middle", and "deep" zones), which are composed of sandstone, siltstone, and claystone, and separated by mudstone. The beds have varying thickness and lateral continuity. Some of the thicker beds appear to be more laterally extensive, and split into several thinner, finer-grained beds. In the northern portion of the site the shallow zone beds are thicker and coarser, whereas to the south they appear to split, thin, and pinch out.

- The Lower Mehrten consists of thick sand and gravel beds with possibly some volcanic mudflow. The sand appears relatively uniform in thickness and widespread in extent.

- The underlying Valley Springs Formation consists of volcanic sandstone ("lava sand") and claystone.

27. The Bear Mountains and Melones fault zones, part of the Sierra Foothills fault system, are approximately 10 and 19 miles east of the facility, respectively. Neither of these fault zones is considered active, however. There are no Holocene faults in the facility area.

GROUNDWATER

28. The water table lies within the middle zone of the Upper Mehrten Formation (Zone A) at an average depth of about 50 feet MSL. This depth corresponds to about 70 feet below the natural ground surface level. Seasonal fluctuations in the groundwater elevation range between 1 and 15 feet. Within the shallow Laguna Formation there are isolated seasonal zones of perched groundwater. The uppermost part the Upper Mehrten is unsaturated in most parts of the site.

29. The natural groundwater gradient direction in the Upper Merhten is to the southwest, but is locally to the west. The alteration of the natural gradient appears to be attributable to the influence of the pump and treat system.

30. Most regional and on-site groundwater production is from the Lower Mehrten and Valley Springs Formations, which are part of the extensive groundwater aquifer system underlying the Sacramento Valley. The regional gradients are to the southwest, and are influenced by recharge from the American and Consumnes Rivers, and heavy pumping near Elk Grove. West of the facility, the Laguna Formation is also a source of water supply.

31. The beneficial uses of groundwater are domestic, municipal, irrigation, agriculture, stock watering, process, and service supply. There are two onsite supply wells, Wells A and E, which provide water for onsite domestic use, irrigation, dust control and fire suppression. Plans for 1999 include the de-commissioning of Well A and the installation of a 300,000 gallon water supply tank.

CORRECTIVE ACTION

32. A release of waste constituents from the landfill to groundwater was discovered in 1989. Numerous detection and corrective action monitoring wells have since been installed in the A, B, and C zones of the Merhten formation, as identified in MRP No. 99-053.

33. Monitoring of the A Zone shows the presence of various volatile organic compounds (VOCs), including, but not limited to, tetrachloroethene, trichloroethene, 1,2-dichloroethene, and vinyl chloride. The "A" zone VOC plume extends beyond the landfill footprint almost to the County property boundary to the southwest. Inorganic constituents detected at elevated levels include bicarbonate, chloride, and sulfate. The source area was identified as the unlined landfill module (M1). The plume has also migrated down into the B zone, where concentrations are lower and the plume is less extensive. Trace VOCs have been detected in one well in the C Zone.

34. The Discharger has installed a groundwater extraction system, including several A Zone extraction wells and a pump and treat system. The extraction wells are shown in Attachment D: Groundwater Monitoring Well Map. The system includes two air stripper towers, a carbon absorption filter, and several extraction wells. Pump and treat remediation began in April 1995, with the objective of containing the spread of the plume and reducing VOC levels in the source area. Discharge is to Deer Creek under NPDES Permit No. CA0083681 (Order No. 95-025).

35. To control landfill gas (LFG), the Discharger also installed a gas flaring facility and numerous gas extraction wells, initiating LFG extraction in January 1997.

WASTE MANAGEMENT UNIT DESIGN

36. Under the criteria of Section 20260 (b)(1) of Title 27, the natural geologic materials underlying the site are not sufficient to protect beneficial uses of groundwater. Section 20260 (b)(2) therefore requires a minimum, prescriptive two-foot thick, single clay liner ($k \leq 1 \times 10^{-6}$ cm/sec).

37. The Federal Subtitle D design criteria for new MSW landfills, and lateral expansions of existing landfills, are as follows:

    * a leachate collection and removal system (LCRS)
    * a single synthetic liner at least 40 mil thick (at least 60 mil if HDPE)
    * two feet of compacted soil, $k \leq 1 \times 10^{-7}$ cm/sec ($\approx$ 0.1 feet/year)

    The LCRS must convey all leachate which reaches the liner to a sump without relying on unlined or clay-lined conveyances. Engineered alternative designs are allowed in lieu of the prescriptive standard if the design meets the performance criteria of the regulation (40 CFR Sections 258.40 (a)(1) and (c)), and is approved as an engineered alternative by the Board under Section 20080(b) of Title 27.

38. Implementation of Subtitle D and SWRCB Resolution 93-62 containment criteria for a Class III MSW landfill base-liner, as applied to for this site, are more stringent than Title 27.

39. Although Module M1 footprint is unlined, it qualifies as an "existing" Class III MSWLF under Section 20080 (d) of Title 27 and, with the exception of closure, is therefore exempt from the Title 27 prescriptive containment criteria (the landfill also pre-dates and is exempt from the Subtitle D containment criteria). However, since there has been a release from the WMU , it must comply with the Title 27 requirements for monitoring and corrective action.

40. Module M1-L of Landfill 1 was constructed in phases approved in previous WDRs Order No. 95-078 as an engineered alternative design (EAD) to the prescriptive Title 27 and Subtitle D designs. The approved EAD allowed for substituting a geosynthetic clay liner (GCL) for one foot of clay in Phase II and two feet of clay for subsequent phases. The Discharger justified the EAD based on the lack of available onsite clay and inadequate shear properties of local offsite clay, which made it unsuitable for WMU construction.

41. In addition, the base liner of M1-L is cross-sloped at 1.5% toward the LCRS collection trench, which has a 2% slope toward the leachate collection sump. Each trench contains a six-inch perforated pipe. All M1-L phases have 3:1 horizontal-to-vertical interior side slopes and upon closure, the Discharger proposes to construct 4:1 or flatter horizontal-to-vertical final exterior slopes.

42. The Discharger proposes to construct the Landfill 2 base liner, LCRS, and side slopes using the same engineered alternative design as used in M1-L, as follows:

LCRS: Base
* minimum one-foot operations layer
* nonwoven geotextile filter fabric (minimum eight oz. per square yard)
* one-foot gravel drainage layer ($k \geq 0.1$ cm/sec)

LCRS: Side Slopes:
* Minimum two-foot sand operations layer ($k \geq 1 \times 10^{-3}$ cm/sec)

Composite Liner: Base & Side Slopes:
* HDPE geomembrane (bottom side textured)
* geosynthetic clay liner ($k \leq 5 \times 10^{-9}$ cm/sec)
* Prepared compacted subgrade

43. The Discharger is requesting approval of the EAD for Landfill 2 based on the Board's approval of the same EAD for M1-L of Landfill 1.

44. The Board finds that the Discharger has made the demonstration required by Section 20080(b) of Title 27, namely that construction of a prescriptive standard liner is unreasonably or unneccessarily burdensome and will cost substantially more than an EAD, and that there is a specific EAD that is consistent with both the performance goal and the prescriptive standard which affords equivalent protection against water quality impairment. This demonstration was made in the October 1998 Joint Technical Document, Appendix E.

The Board also finds that the Discharger has demonstrated that the EAD satisfies the performance criteria contained in 40 CFR Section 258.40 because (a) leachate will be controlled during the operational life of each individual module and landfill gas will be controlled as long as the completed modules are biologically active, (b) the expansion WMUs will employ a composite liner consisting of 60-mil HDPE underlain by a geosynthetic clay liner, (c) site-specific hydrologic, climatic, and leachate characteristics have been considered in designing the expansion as described in the Joint Technical Document and the Final Supplemental Environmental Impact Report, and (d) the groundwater point of compliance is at the southern edge of the landfill and was set after considering hydrogeologic factors, leachate characteristics, groundwater flow, proximity of groundwater users, alternative drinking water supplies, existing groundwater contamination, public health, and the predictable capability of the landfill operator.

WMU SITING

45. Section 20240 (c) of Title 27 requires that *new* landfills be "sited, designed, constructed and operated", to ensure or maintain at least five feet of separation between the contained wastes and the highest anticipated level of the groundwater table. Existing landfills are to be "operated" to maintain the required separation. The Discharger has adequately demonstrated that there will be greater than five feet of separation from groundwater at the lowest area of Landfill 2 (the leachate collection sump for Module 10). Calculations indicate that at least 16 feet of separation can be maintained, based on monitoring data, which shows a maximum groundwater elevation of 55 feet MSL, and a calculated capillary rise of six feet.

46. The Discharger has provided the necessary document certifications pursuant to Section 20240(d) of Title 27 for design and construction of each existing landfill module at the site.

47. The proposed expansion landfill footprint will be set back at least 50 feet from the site boundary, which, along with a minimum 60-foot wide drainage bench along the site boundary, will provide for at least a 110-foot buffer between the property line and the landfilled waste.

48. Approximately 32.25 million cubic yards of soil will be excavated during the course of preparing the subgrade and perimeter drainage channels to accommodate the expansion landfill. The soil will be stockpiled for use in Landfill 1 as final cover and for other future operations.

CLOSURE AND FINANCIAL ASSURANCES

49. Since M1, the unlined portion of Landfill 1, was not closed prior to the federal deadline (9 October 1993), the closure requirements of Subtitle D apply to all of Landfill 1.

50. Final cover has already been installed on a 34-acre portion of the southern side-slopes of M-1 where leachate seeps have historically been observed. The Discharger has proposed a composite cover for the remainder of LF-1. Closure will be completed in phases as portions of LF-l reach maximum design fill elevation and are ready for foundation material, except on side-slopes contiguous with Landfill 2 liner construction (Modules M-9 and M-11). The final grade upon closure will be a 325 feet MSL on the deck grading down to 120 feet MSL at the toe.

51. The Discharger has submitted a Preliminary Closure and Post-Closure Maintenance Plan describing the planned closure configuration for both landfills. The final cover designs are as follows:

Side Slopes:
* minimum one-foot vegetative cover soil
* one-foot wide geocomposite drain strips placed on five-foot centers
* 60 mil HDPE geomembrane (double textured)
* GCL ($k \leq 1 \times 10^{-9}$ cm/sec) *or* minimum one-foot thick clay layer ($k \leq 1 \times 10^{-6}$ cm/sec)
* a minimum two-foot thick soil foundation layer (one foot of which will be intermediate cover)

Top Deck:
* minimum one-foot vegetative cover soil
* 60 mil HDPE geomembrane (double textured)
* GCL ($k \leq 1 \times 10^{-9}$ cm/sec) *or* minimum one-foot thick clay layer ($k \leq 1 \times 10^{-6}$ cm/sec)
* a minimum two-foot thick soil foundation layer (one foot of which will be intermediate cover)

The use of GCL in lieu of clay would be an EAD to the prescriptive Subtitle D standard for a composite liner.

52. The top deck will be sloped at 3% for adequate drainage. Perimeter slopes in the existing landfill area will be no greater than 3:1 (horizontal-to-vertical) in M1, 4:1 in M-1L, and the final slopes in the expansion area will range from 4:1 to 5:1. Erosion control and access will be achieved by cutting 15-foot wide benches at least every 50 vertical feet.

53. Permanent excavation and landfill slopes have a minimum safety factor of 1.6 and 1.5, respectively. The landfill cover will have a safety factor of 1.3 under saturated conditions and 1.7 under unsaturated conditions. Since the facility is not near any known active faults, the

Discharger assumed low seismic activity for the purposes of landfill cover slope stability calculations, estimating a displacement from a maximum probable earthquake (MPE) of less than one foot.

54. The financial assurance mechanism consists of an enterprise fund for closure and a pledge of revenue for post-closure maintenance. Monies are paid into the fund annually as waste is discharged to the landfill. Currently, $9.5 million of the $12.3 million estimated to be needed for closure of Landfill 1 is funded.

55. The Discharger has provided $800,000 to cover the costs of corrective action for a known or reasonably forseeable release (RFR) at the existing landfill. The financial assurance mechanism is a pledge of revenue. It is estimated that this level of funding may also be sufficient to cover corrective action costs for an RFR at the first two expansion modules. Board staff has approved the plan and amount funded for the existing landfill, pending further development of estimates for the expansion modules. The plan includes expanding existing facilities in place for corrective action to address any reasonably foreseeable release.

CEQA AND OTHER CONSIDERATIONS

56. The action to revise WDRs for the existing solid waste management facility (Landfill 1), and the proposed expansion (Landfill 2), is subject to the provisions of the California Environmental Quality Act (Public Resources Code Section 21000, et seq.).

57. The Discharger prepared a final environmental impact report (EIR) for the proposed expansion in December 1994. The EIR identified significant environmental impacts associated with the landfill expansion project and included a site mitigation plan for each significant impact. The County Board of Supervisors (Supervisors) did not certify the EIR at that time, however, because it did not include project alternatives. After public hearings, the Supervisors appointed an advisory committee to develop alternatives for the project. The alternatives were presented in an August 1998 Supplemental EIR. On October 22, 1998, the Supervisors certified the EIR and Supplemental EIR for the landfill expansion as adequate and complete, and on 10 November 1998, finalized approval of the project.

58. The EIR identified the following potential significant water quality impacts:
    a) spread of existing groundwater contamination
    b) leachate may infiltrate groundwater
    c) landfill gas may impact groundwater
    d) storm water runoff may contact landfill wastes and increase leachate
    e) expansion will displace area of wetlands

    The EIR evaluated the impacts and found that the implementation of a corrective action plan and compliance with Title 27 and Subtitle D, will provide adequate water quality protection and reduce potential impacts to a less-than-significant level. These waste discharge requirements include requirements that avoid or substantially lessen significant impacts to water quality.

59. This order implements:

    a) *The Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, Fourth Edition*;

b) The prescriptive standards and performance goals of Chapters 1 through 7, Subdivision 1, Division 2, Title 27, of the CCR, effective 18 July 1997, and subsequent revisions;
c) The prescriptive standards and performance criteria of RCRA Subtitle D, Part 258;
d) State Water Resources Control Board Resolution No. 93-62, *Policy for Regulation of Discharges of Municipal Solid Waste*, adopted 17 June 1993.

PROCEDURAL REQUIREMENTS

60. All local agencies with jurisdiction to regulate land use, solid waste disposal, air pollution, and to protect public health have approved the use of this site for the discharges of waste to land stated herein.

61. The Board has notified the Discharger and interested agencies and persons of its intention to revise the WDRs for this facility.

62. In a public hearing, the Board heard and considered all comments pertaining to this facility and discharge.

IT IS HEREBY ORDERED that Order No. 95-078 is rescinded, and it is further ordered that the County of Sacramento, Public Works Agency and its agents, assigns and successors, in order to meet the provisions of Division 7 of the California Water Code and the regulations adopted thereunder, shall comply with the following:

A. Prohibitions

1. The discharge of "hazardous waste" and "designated waste" at this facility is prohibited. The discharge of leachate from the landfill unit and LCRSs, septage, chemical toilet waste, truck wash-down liquids and other liquid wastes at this facility is prohibited. For the purposes of this Order, the terms "hazardous waste" and "designated waste" are as defined in Title 27.

2. Discharges of waste to either a landfill unit that has not received wastes or to a lateral expansion of a landfill unit are prohibited, unless the discharge is to an area equipped with a containment system which meets requirements in B. Specifications, below.

3. The discharge of liquid or semi-solid waste (i.e., waste containing less than 50 percent solids) to LF-1 and LF-2 is prohibited, with the following exceptions:

   a. de-watered sewage or water treatment sludge as provided in Section 20220(c) of Title 27 may be disposed of on lined areas, and

   b. leachate may be used for dust control over lined areas with the approval of Board staff.

4. The discharge of solid waste containing free liquid or moisture in excess of the waste's moisture holding capacity to LF-1 or LF-2 is prohibited.

5. The disposal of containerized liquids at this facility is prohibited.

6. The discharge of solid or liquid waste or leachate to surface waters, surface water drainage courses, or groundwater is prohibited.

7. The discharge of waste to ponded water from any source is prohibited.

8. The discharge of waste within 50 feet of surface waters is prohibited.

9. The discharge of wastes which have the potential to reduce or impair the integrity of containment structures or which, if commingled with other wastes in the unit, could produce violent reaction, heat or pressure, fire or explosion, toxic by-products, or reaction products which in turn:

   a. require a higher level of containment than provided by the unit,
   b. are "restricted hazardous wastes", or
   c. impair the integrity of containment structures,

   is prohibited.

10. The disposal of wastes containing greater than one percent (>1%) friable asbestos is prohibited.

11. The disposal of shredded automobile bodies, household appliances and sheet metals (shredder waste) at this facility is prohibited.

12. The discharge of wastes to Landfill 2 modules is prohibited until the module liner is constructed and certified to be complete by the Discharger's engineer and approved by Board staff.

13. The discharge of landfill wastes to a storm water sedimentation basin, including (but not limited to) sewage sludge and VOC-impacted groundwater, is prohibited.

B. Discharge Specifications

General Specifications

1. The treatment or disposal of waste shall not cause pollution or a nuisance as defined in the California Water Code, Section 13050.

2. The discharge of wastes shall not cause water quality degradation by allowing a statistically significant increase over background or baseline concentrations as determined in accordance with Monitoring and Reporting Program No. 99-053.

3. Wastes shall only be discharged into, and shall be confined to, the landfill modules specifically designed for their containment.

4. A minimum separation of 13 feet shall be maintained between wastes or leachate and the highest anticipated elevation of underlying groundwater including the capillary fringe.

5. Prior to the discharge of waste to a waste management module, all wells within 500 feet of the module shall have sanitary seals which meet the requirements of the Sacramento County Health Department or shall be properly abandoned. A record of the sealing and/or abandonment of such wells shall be sent to the Board and to the State Department of Water Resources.

6. Leachate generation by a landfill unit shall not exceed 85% of the design capacity of the sump pump. If leachate generation exceeds this value or if the depth of fluid in an LCRS exceeds the minimum needed for efficient pump operations, then the Discharger shall immediately cease the discharge of sludges and other high-moisture wastes to the landfill unit and shall notify the Board in writing within seven days. Notification shall include a timetable for corrective action necessary to reduce leachate production.

General WMU Construction

7. Clay liners shall have a maximum hydraulic conductivity of 1×10^{-7} cm/sec and a minimum relative compaction of 90%. Landfill caps shall have a maximum hydraulic conductivity of 1×10^{-6} cm/sec and a minimum relative compaction of 90%. Hydraulic conductivities of liner materials shall be determined by laboratory tests using solutions with similar properties as the fluids that will be contained. Hydraulic conductivities of cap materials shall be determined by laboratory tests using water. Hydraulic conductivities determined through laboratory methods shall be confirmed by field testing in accordance with the Standard Provisions and Reporting Requirements as described in Provision D.1. Construction methods and quality assurance procedures shall be sufficient to ensure that all parts of the liner and cap meet the hydraulic conductivity and compaction requirements.

8. LCRSs shall be designed, constructed, and maintained to collect twice the anticipated daily volume of leachate generated by the WMU and to prevent the buildup of hydraulic head on the underlying liner at any time. The depth of fluid in any LCRS sump shall be kept at or below the minimum needed to ensure efficient pump operation.

9. Each landfill unit phase constructed after the effective date of this Order shall be designed and constructed in accordance with Title 27 and this Order and approved by Board staff prior to operation. Prior to the beginning of construction for each new construction phase, a Final Design Report shall be submitted to the Board for review and approval and shall include, but not be limited to, the engineered design plans for the WMU, the contract specifications, a construction quality assurance (CQA) plan to verify that construction specifications will be met, and a revised water quality monitoring plan. Approval of the final design report shall be obtained from Board staff prior to construction of the landfill liner or cap. A final construction report shall be submitted for approval by Board staff after each phase of construction and prior to the discharge of waste into the constructed phase. The final construction report shall include, but not be limited to, as-built plans for the WMU, a CQA report with a written summary of the CQA program and all test results, analyses, and copies of the inspector's original field notes, and a certification as described in the Standard Provisions and Reporting Requirements.

Landfill Specifications

10. All WMU containment structures installed after 9 October 1993 shall meet the requirements of Subtitle D, including the prescriptive requirements described in Finding No. 37, or the EAD described in Finding No. 42.

11. All WMU containment structures shall meet the general criteria set forth in Section 20320 of Title 27.

12. WMU containment structures shall be designed and constructed under the direct supervision of a California registered civil engineer, or a certified engineering geologist, and shall be certified by that individual as meeting the prescriptive standards (except where exempt or approved as an engineered alternative design herein) and performance goals of Title 27 prior to waste discharge.

13. Municipal solid waste shall be discharged to either (1) that portion of a module which received wastes (i.e. that active portion of the module which is within the boundaries of the existing footprint), or (2) to an area equipped with a containment system which meets the additional requirements for both liners and leachate collection systems specified below.

14. New landfill units and lateral expansions shall not be located in wetlands unless the Discharger has successfully completed, and the Board has approved, all demonstrations required for such discharge under 40 CFR 258.12(a).

15. Landfill leachate shall be discharged to an appropriate on-site and/or off-site liquid waste management facility, or as otherwise approved by Board staff.

Landfill Closure Specifications

16. At closure, each landfill shall receive a final cover in accordance with the prescriptive standards of Subtitle D and Title 27, or the EAD, as described in Finding No. 51.

17. Vegetation shall be planted and maintained over each closed landfill module. Vegetation shall be selected to require a minimum of irrigation and maintenance and shall have a rooting depth not in excess of the vegetative layer thickness.

18. Closed landfill units shall be graded to at least a three-percent (3%) grade and maintained to prevent ponding.

19. The WMU slopes shall not exceed a horizontal-to-vertical ratio of 1.75:1, without benching, to ensure slope stability. Other areas with slopes greater than ten percent, surface drainage courses, and areas subject to erosion by wind or water shall be designed and constructed to prevent such erosion.

20. The WMU final slopes shall not be less than three percent grade to prevent ponding and infiltration.

Protection from Storm Events

21. Both active and closure WMUs shall be designed, constructed, and operated to prevent inundation or washout due to floods with a 100-year return period. Class III landfill modules and related containment structures shall be constructed and maintained to prevent, to the greatest extent possible, ponding, infiltration, inundation, erosion, slope failure, washout, and overtopping under 100-year, 24-hour precipitation conditions.

22. Precipitation and drainage control systems shall be constructed on both active and closure WMUs. They shall be designed and constructed to accommodate the anticipated volume of precipitation and peak flows from surface runoff under 100-year, 24-hour precipitation

conditions contained in the Standard Provisions and Reporting Requirements referenced in Provision D.2 below.

23. Annually, prior to the anticipated rainy season but no later than **15 November**, any necessary erosion control measures shall be implemented, and any necessary construction, maintenance, or repairs of precipitation and drainage control facilities shall be completed to prevent erosion or flooding of the facility and to prevent surface drainage from contacting or percolating through wastes. By **1 November of each year**, the Discharger shall submit to the Board a Winterization Plan describing measures planned to prepare the site and conduct operations during the wet season. By **30 January of each year**, the Discharger shall submit an annual report to the Regional Board describing measures taken to comply with this specification (the information may be included in the Annual Monitoring Report per the monitoring program).

24. Surface drainage shall not be allowed to contact or percolate through wastes.

25. New landfill units, existing landfill units, and lateral expansions thereof, shall not be located in the 100-year floodplain of any surface water unless the Discharger has successfully completed, and the Board has approved, all demonstrations required for such discharge under Subtitle D (40 CFR 258.11).

C. RECEIVING WATER LIMITATIONS

1. The concentrations of waste constituents, including all monitoring parameters and Constituents of Concern, passing the Points of Compliance in receiving waters shall not exceed the Concentration Limits established as in the "Water Quality Protection Standard" established pursuant to Monitoring and Reporting Program (MRP) No. 99-053, which is attached to and made part of this Order.

2. Any disturbance of land shall not increase the turbidity of the receiving waters by more than 20% over immediate upstream levels.

D. PROVISIONS

1. The Discharger shall comply with these WDRs and the attached MRP No. 99-053. A violation of the MRP is a violation of these waste discharge requirements. The Discharger shall further comply with all applicable provisions of Title 27 and Subtitle D not specifically referred to in this Order.

2. The Discharger shall comply with the Standard Provisions and Reporting Requirements, dated August 1997, which are hereby incorporated into this Order. A violation of any of the Standard Provisions and Reporting Requirements is a violation of these waste discharge requirements.

3. Prior to module construction, the Discharger shall obtain approval from the United States Fish and Wildlife Service, and shall obtain any and all permits required under federal, state, or local laws for the protection of endangered and/or threatened species and their habitats. A copy of the USFWS permit shall be submitted to the Board prior to module construction. Prior to and concurrent with module construction, and as necessary during the operational life of the landfill, the Discharger shall further implement the Wetlands Mitigation and

Monitoring Program, and submit annual monitoring reports as described in MRP No. 99-053, a part of this Order. The Discharger shall further conduct long term monitoring of wetlands created on-site pursuant to this plan and to MRP No. 99-053.

4. The Discharger shall maintain waste containment facilities and precipitation and drainage control systems throughout the post-closure maintenance period, and shall immediately notify the Board of any flooding equipment failure, slope failure, or other change in site conditions which could impair the integrity of waste or leachate containment facilities or of precipitation and drainage control structures.

5. The Discharger shall continue to monitor each WMU and all underlying media per Monitoring and Reporting Program No. 99-053 throughout the post-closure maintenance period, and shall continue until the Board determines that the wastes remaining at the site no longer threaten water quality.

6. The Discharger shall have the continuing responsibility to assure protection of usable waters from discharged wastes, including leachate, that may be generated and discharged during the closure, and post-closure maintenance period of the facility and during subsequent use of the property for other purposes.

7. The Discharger shall maintain legible records of the volume and type of each waste discharged for each landfill module and the manner and location of discharge. Such records shall be maintained at the facility or the facility's administration office until the beginning of the post-closure maintenance period. These records shall be available for review by representatives of the Board and of the State Water Resources Control Board at any time during normal business hours. At the beginning of the post-closure maintenance period for each of the landfill areas, copies of these records shall be sent to the Regional Board.

8. The Discharger shall provide proof to the Board **within sixty days after completing final closure** that the deed to the landfill facility property, or some other instrument that is normally examined during title search, has been modified to include, in perpetuity, a notation to any potential purchaser of the property stating that:

   a. the parcel has been used as a municipal solid waste landfill;

   b. land use options for the parcel are restricted in accordance with the post-closure land uses set forth in the post-closure plan and in WDRs for the landfill; and

   c. in the event that the Discharger defaults on carrying out either the post-closure maintenance plan or any corrective action needed to address a release, then the responsibility for carrying out such work falls to the property owner.

9. The Discharger or persons employed by the Discharger shall comply with all notice and reporting requirements of the State Department of Water Resources with regard to the construction, alteration, destruction, or abandonment of all monitoring wells used for compliance with this Order or with MRP No. 99-053, as required by Sections 13750 through 13755 of the California Water Code.

10. In the event of any change in ownership of this waste management facility, the Discharger shall notify the succeeding owner or operator in writing of the existence of this Order prior to the change in ownership. A copy of that notification shall be sent to the Board.

11. By **30 January** of each year, the Discharger shall submit to the Board an updated preliminary closure and post-closure maintenance plan, prepared in accordance with Section 21769 of Title 27. The plan shall include all information necessary for Board staff review and approval of financial assurance cost estimates for closure and post-closure maintenance of each landfill submitted to the California Integrated Waste Management Board (CIWMB), pursuant to Sections 20950(f), and 22205 et seq. of Title 27.

12. The Discharger shall obtain and maintain adequate assurances of financial responsibility for initiating and completing corrective action for all known and reasonably foreseeable releases from a waste management unit at the facility in accordance with Sections 20380(b) and 22222 of Title 27. The Discharger shall provide the current corrective action cost estimate to the Regional Board for review and approval by **1 November 1999** and annually for the term of this permit. The Discharger shall demonstrate to the CIWMB and report to the Regional Board that it has established one of the acceptable financial assurance mechanisms described in Sections 22228 and 22240-22254 of Title 27 in at least the amount of the cost estimate approved by the Regional Board.

    In the event the Regional Board determines that the County of Sacramento has failed or is failing to perform corrective action as required by law, the California Integrated Waste Management Board may direct the County of Sacramento to pay from the pledged revenue such amounts as necessary to insure sufficient corrective action. The County of Sacramento shall be obligated to use such funds for corrective action in accordance with the directive of the Regional Board.

    In accordance with Title 27, the Discharger shall further provide and maintain adequate financial assurances to cover the costs of closure and post-closure maintenance for each waste management unit and shall report to the Regional Board by **1 July 1999** that it has demonstrated financial responsibility to the CIWMB.

13. Prior to construction of Module M-10, the Discharger shall determine the volume of floodwater displaced by units M-1 and M-10 during a 100-year flood event. To provide mitigation, the Discharger shall excavate the same volume within the Cosumnes River/Deer Creek 100-year floodplain (below 120 foot MSL), on County-owned property adjacent to the landfill. All appropriate permits shall be obtained before construction begins.

Compliance Schedule

14. The Discharger shall complete the tasks outlined in these WDRs and the attached MRP No. 99-053 in accordance with the following time schedule:

Task	Compliance Date
Construction of new modules in Landfill 2	
a. Submit revised monitoring system and program	**18 months prior to start of construction**

	Task	Compliance Date
b.	Construct proposed monitoring wells	**1 year prior to start of construction**
c.	Submit design plans, specifications, construction schedule, and construction quality assurance plan	**3 months prior to start of construction of test pad and liner system**
d.	Submit as-built plans, construction quality assurance, and certification report	**1 month prior to the discharge of waste**

14. By **1 November 1999**, the Discharger shall submit a schedule for the closure of Landfill 1, including submission of the final closure plan for that landfill.

15. A copy of this Order shall be kept at the discharge facility for reference by operating personnel. Key operating personnel shall be familiar with its contents.

16. The Board will review this Order periodically and will revise these requirements when necessary.

If, in the opinion of the Executive Officer, the Discharger fails to comply with the provisions of this order, the Executive Officer may apply to the Attorney General for judicial enforcement or issue a complaint for Administrative Civil Liability.

I, GARY M. CARLTON, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 30 April 1999.

GARY M. CARLTON, Executive Officer

JDM:dlk

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. 99-053
FOR
COUNTY OF SACRAMENTO
PUBLIC WORKS AGENCY
KIEFER LANDFILL
CLASS III LANDFILLS

The Discharger shall maintain water quality monitoring systems that are appropriate for detection monitoring and corrective action, and that comply with Subchapter 3, Chapter 3, Subdivision 1, Division 2, Title 27, CCR, and any other applicable provisions therein.

Compliance with this Monitoring and Reporting Program, and with the companion Standard Provisions and Reporting Requirements, is ordered by Waste Discharge Requirements (WDRs) Order No. 99-053. Failure to comply with this MRP, or with the Standard Provisions and Reporting Requirements, constitutes non-compliance with the WDRs and with Division 7 of the Water Code, which can result in the imposition of civil monetary liability.

I. REPORTING

The Discharger shall report monitoring data and information as required in this Monitoring and Reporting Program and as required in the Standard Provisions and Reporting Requirements. Reports which do not comply with the required format will be rejected and the Discharger shall be deemed to be in noncompliance with the WDRs.

A narrative discussion of the monitoring results, including notations of any water quality violations shall precede tabular summaries of the water quality data. Further, each monitoring report shall include a summary and certification of completion of all Standard Observations for the waste management unit (WMU), for the perimeter of the WMU, and for the receiving waters. The standard observations shall be performed on a weekly basis and shall include those elements as defined in the Standard Provisions and Reporting Requirements.

In reporting the monitoring data required by this program, the Discharger shall arrange the data in tabular form so that the date, the constituents, the concentrations, and the units are readily discernible. The data shall be summarized in such a manner so as to illustrate clearly the compliance with waste discharge requirements or the lack thereof. Historical and current monitoring data shall be graphed at least once annually. Graphs for the same constituent shall be plotted at the same scale to facilitate visual comparison of monitoring data.

The results of any monitoring done more frequently than required at the locations specified herein shall be reported to the Board in the monitoring report(s) for that period.

A. REQUIRED REPORTS

1. Detection Monitoring Report

Detection Monitoring Reports (DMRs) shall be prepared and submitted to the Board semi-annually by the 15th day of the month following the end of each calendar semester (**15 July and 15 January**). The reports shall include the results of all monitoring programs listed herein.

2. Annual Report

An Annual Report which summarizes the monitoring results for the prior four quarters shall be submitted to the Board by **31 January** each year. The Discharger shall submit the Annual Report as specified in the Standard Provisions and Reporting Requirements. The report shall contain both tabular and graphical summaries of the detection and corrective action monitoring data and a discussion of the progress toward re-establishment of compliance with WDRs and the Water Quality Protection Standard (WQPS). In reporting the progress of corrective action, the report shall include contaminant contour maps for representative volatile organic compounds and inorganic constituents and compare the current plumes with those prior to the start of corrective action. The report shall also include calculations of the amounts of contaminant removed, as listed in Table IV.A.2 herein. In lieu of submitting a separate report, the Annual Report information may instead be included with the second semester Detection Monitoring Report. The Annual Report shall also include the results of the soil gas monitoring program.

3. Wetlands Mitigation and Monitoring

The results of monitoring conducted pursuant to the Wetlands Mitigation and Monitoring Plan (WMMP), as approved by Board staff, shall be submitted **annually by 31 August** of each year. In addition to reporting the monitoring results, the report shall include maps showing impacted areas, narrative descriptions, and summaries of mitigation and preservation activities.

4. Water Quality Protection Standard Report

As noted above, any changes to the water quality protection standard are to be included in the Annual Report.

5. Constituents-of-Concern (COC)

The results of COC monitoring shall be submitted with, or reported in, the Annual Report for that year.

6. Notification of Release and Re-test

For any WMU, if the results of a detection monitoring program shows that there is a measurably significant increase in an indicator parameter or waste constituents over the WQPS at or beyond the points of compliance (i.e., measurably significant evidence of an exceedence or release), the Discharger shall:

a. immediately notify the Regional Board by telephone or fax of the exceedence,

b. within seven days of the initial findings, follow up with written notification (or acknowledgment of the Board's finding),

c. within 30 days of the initial finding, re-sample for the constituent(s) or parameter(s) at the point where the standard was exceeded, and

d. within 60 days of the initial finding, submit the results of the re-sampling and statistical analysis, indicating whether or not an exceedence or release was confirmed by the re-test.

7. **Existing Release - Amended Programs**

Within 30 days upon confirmation of an exceedence from an existing release, the Discharger shall submit for Board staff approval an amendment to the Corrective Action Program, describing measures planned or taken to mitigate the exceedence. The shall also note any necessary changes to the DMP and Corrective Action Monitoring Program monitoring locations as a result of the exceedence (see Section V.C herein).

8. **Responding to a Release Discovery**

Upon verifying a measurably significant evidence of a release from a WMU according to Section 20420(j) of Title 27 and Section A.6 of this MRP, the Discharger shall follow the procedures and timeline described in Section 20420(k) of Title 27.

II. MONITORING PROGRAMS

A. SOLID WASTE MONITORING

The Discharger shall monitor and report all wastes discharged to each WMU in Landfills 1 and 2 on a monthly basis as follows:

Table II.A: Nonhazardous Solid Waste Monitoring

Parameter	Units	Reporting Frequency
Quantity discharged	cubic yards or tons	Semi-annually
Type of material discharged	---	Semi-annually
Capacity of landfill/module remaining	percent	Annually

B. CONSTITUENTS OF CONCERN

Except as otherwise indicated in this Order, the Discharger shall monitor each media of each new and existing landfill module for applicable Constituents of Concern (per federal Subtitle D and State Water Resources Control Board Resolution 93-62). The monitoring locations, analytical methods, and frequency of analysis are as follows:

1. Monitoring Locations

a. Leachate - Sump L-1 in Landfill 1 and one LCRS sump for each module at Landfill 2, as identified in Table II.C.1

b. Unsaturated zone

i) pore fluid - lysimeters in (or near) the unlined module M-1, and underlying each Landfill 2 module containing waste.
ii) landfill gas - a representative gas probe for each module of Landfills 1 and 2

c. Groundwater - a least one monitoring well screened in each location as follows:

i) each aquifer zone in the source area near M-1 (i.e., Mws 2a, 2b, and 2c)

ii) in upgradient background wells

2. Monitoring Schedule

TABLE II.B
CONSTITUENTS OF CONCERN MONITORING

Constituents of Concern	Units	Frequency
Carbonate	mg/L	Every 5 years
Bicarbonate Alkalinity	mg/L	Every 5 years
Volatile Organic Compounds (EPA Method 8260)	ug/L	Every 5 years
Semi-Volatile Organic Compounds (EPA Method 8270)	ug/L	Every 5 years
Organochlorine Pesticide, PCBs (EPA Method 8080)	ug/L	Every 5 years
Chlorophenoxy Herbicides (EPA Method 8150)	ug/L	Every 5 years
Organophosphorus Compounds (EPA Method 8141)	ug/L	Every 5 years
Inorganics (dissolved)	mg/L	Every 5 years

The constituent-by-constituent listings of Constituents of Concern (COCs) for each of the above groups are included in Attachment E, which accompanies this Order.

C. LEACHATE MONITORING

1. Monitoring Locations

The leachate monitoring locations shall be as follows:

TABLE II.C.1
LEACHATE MONITORING LOCATIONS

Landfill	Landfill Module	Monitoring Location
1	M1	unlined
1	M1-L	Sump L-1
2	M-2	Sump L-2
2	M-3	Sump L-3
2	M-4	Sump L-4
2	M-5	Sump L-5
2	M-6	Sump L-6
2	M-7	Sump L-7
2	M-8	Sump L-8
2	M-9	Sump L-9
2	M-10	Sump L-10
2	M-11	Sump L-11

2. Monitoring Schedule

Leachate monitoring shall be conducted as specified in Table II.C.2.

TABLE II.C.2
LEACHATE MONITORING PROGRAM

Parameter	Units	Frequency
Field Parameters		
Flow Rate	gallons/day	Monthly
Volume	gallons	Monthly
Specific Conductance	mhos/cm	Monthly
pH	pH units	Monthly
Monitoring Parameters		
Total Dissolved Solids (TDS)	mg/L	Quarterly
Chlorides	mg/L	Quarterly
Sulfates	mg/L	Quarterly
Volatile Organic Compounds	ug/L	Quarterly
Constituents of Concern		
Table H.B constituents	ug/L	Annually

Upon detection of leachate in a previously dry LCRS sump, the leachate shall be sampled in accordance with the above schedule and the results included in the monitoring report. If COC constituents are detected that are not already Monitoring Parameters, then the leachate must be re-sampled for those constituents. If confirmed by re-test, then these constituents must be added to the Monitoring Parameter list and analyzed on a quarterly basis.

All visible portions of synthetic liners shall be inspected on a monthly basis. Each LCRS shall be hydraulically tested annually to demonstrate that it is still operating in conformance with the WDRs. The results shall be reported to the Board in the annual report and include comparison with earlier tests made under comparable conditions.

D. GROUNDWATER ELEVATION MONITORING

Groundwater elevations taken prior to purging the well and sampling for Monitoring Parameters shall be used to fulfill the groundwater gradient/direction analyses required. For each monitored groundwater body, the Discharger shall measure the water level in each well and determine groundwater gradient and direction at least quarterly, including the times of expected highest and lowest elevations of the water level for the respective groundwater body. Groundwater elevations for all upgradient and downgradient wells for a given groundwater body shall be measured within a period of time short enough to avoid temporal variations in groundwater flow which could preclude accurate determination of groundwater gradient and direction. This information shall be included in the semi-annual monitoring reports.

E. WETLANDS MITIGATION AND MONITORING

The Discharger shall monitor wetlands in accordance with the Wetlands Mitigation and Monitoring Plan (WMMP), as approved by Board staff and included in Volume II of the Final Supplemental Environmental Impact Report. Monitoring shall be conducted for a sufficient number of year to ensure that all wetlands created on-site survive for the long term, and shall be discontinued only upon revision of this MRP. The results of monitoring shall be submitted annually, by **31 August** of each year.

III. DETECTION MONITORING

A. GENERAL

The Discharger shall perform Detection Monitoring on all media potentially affected by a release, including surface water, groundwater, and the unsaturated zone. For any given monitored medium, a sufficient number of samples shall be taken from all Monitoring Points and Background Monitoring Points to satisfy the data analysis requirements for a given Reporting Period, and shall be taken in a manner that ensures sample independence to the greatest extent feasible.

The Discharger shall use a Board-approved statistical (or non-statistical) procedure to determine whether there has been a measurably significant increase in a constituent over the water quality protection standard, as set forth in Section 20415(e)(5) of Title 27.

B. UNSATURATED ZONE

Unsaturated zone monitoring devices shall be checked monthly for fluid and monitoring shall include the volume of fluid recovered. The monitoring locations, analytical methods, and frequency of analysis shall be as follows:

1. Monitoring Locations

The unsaturated zone monitoring locations, shown in Attachment C, shall be as listed in Tables III.B.1 and III.B.2 below. Lysimeters and moisture blocks are installed in pairs at each location.

TABLE III.B.1
UNSATURATED ZONE MONITORING LOCATIONS - LANDFILL 1

Module	Upgradient		Downgradient	
	Lysimeter & Moisture Block	Gas Probe	Lysimeter & Moisture Block	Gas Probe
M-1	LYS-10U	---	1U, 2U, 7U, 13U (north), 13 U (south), 14U	---
M-1L (1)	LYS-10U	---	VZ-1, 2, 3, 4	GP-40
M-1L (2)	LYS-10U	---	VZ-5, 6, 7	---
M-1L (3)	LYS-10U	---	VZ-8, 9, 10	---
M-1L (4b)	LYS-10U	---	VZ-11, 12	---

TABLE III.B.2
UNSATURATED ZONE MONITORING LOCATIONS - LANDFILL 2

Module	Upgradient		Downgradient	
	Lysimeter & Moisture Block	Gas Probe	Lysimeter & Moisture Block	Gas Probe
M-2	LYS-M2, 10U	GP-40	LYS-M2	---
M-3	LYS-M3, 35U	GP-40	LYS-M3	GP-37
M-4	LYS-M4, 35U	---	LYS-M4	GP-36, 37
M-5	LYS-M5, 35U	---	LYS-M5	GP-35
M-6	LYS-M6, 35U	---	LYS-M6	GP-34, 35
M-7	LYS-M7	---	LYS-M7	GP-34
M-8	LYS-M8	---	LYS-M8	GP-34
M-9	LYS-M9	---	LYS-M9	GP-38
M-10	LYS-M10	---	LYS-M10	GP-38, 39
M-11	LYS-M11	---	LYS-M11	---

Lysimeters and moisture blocks for Modules 2 through 11 shall be placed under the leachate collection sump. Downgradient lysimeters LYS-1U, 2U, 7U, 13U (north), 13U (south), and 14U shall constitute the "points of compliance" with respect to soil-pore liquid. In order to estimate background levels of COCs prior to the placement of waste in Landfill 2, the Discharger plans to collect and perform Waste Extraction Tests (WET) on soil samples from each Landfill 2 lysimeter location to determine their maximum soluble concentrations in a saturated condition.

2. Monitoring Schedule

The analytes and frequency of unsaturated zone monitoring shall be conducted as specified in Table III.B.3:

TABLE III.B.3
UNSATURATED ZONE MONITORING PROGRAM

Parameter	Units	Frequency	
Field Parameters			
Specific Conductance	mhos/cm	Semi-annually	---
pH	pH units	Semi-annually	---
Monitoring Parameters			
Total Dissolved Solids (TDS)	mg/L	Quarterly	---
Chlorides	mg/L	Quarterly	---
Sulfates	mg/L	Quarterly	---
Nitrate - Nitrogen	mg/L	Quarterly	---
Volatile Organic Compounds[1]	ug/L	Quarterly	Semi-annually
Constituents of Concern			
Table II.B constituents	ug/L	Every 5 years	Every 5 years

[1] If methane or any other VOC carrier gas is detected in the soil gas at this location during the monitoring period.

C. GROUNDWATER

The groundwater surface elevation (in feet and hundredths, M.S.L.) in all wells shall be measured on a quarterly basis and used to determine the velocity and direction of groundwater flow. This information shall be displayed on a water table contour map and/or groundwater flow net for the site and included in the semi-annual monitoring reports.

1. Monitoring Locations

The groundwater detection monitoring points for Landfill 1 and Landfill 2, shown in Attachment D, are as follows:

TABLE III.C.1
GROUNDWATER DETECTION MONITORING LOCATIONS - LANDFILL 1

Module	Aquifer	Monitoring Method[1]	Background	Detection
M1, M1-L	Zone A	Interwell[2]	10A	15A, 24A, 28A, 30A
		Intrawell[2]	12A, 17A, 27A	12A, 17A, 27A
	Zone B	Interwell[2]	10B[3]	6B, 15B, 21B, 23B
		Intrawell[2]	12B, 17B	12B, 17B
	Zone C	Interwell[2]	10C	20C, Well E
		Intrawell[2]	12C	12C

[1] Refers to statistical approach used for Detection Monitoring.
[2] Each well functions as its own background well using historical monitoring data.
[3] Background well data to be pooled as additional wells are installed.

TABLE III.C.2
GROUNDWATER MONITORING LOCATIONS - LANDFILL 2

Module	Aquifer	Monitoring Method[1]	Background Wells		Detection Wells	
			Existing	Proposed	Existing	Proposed
M-2	Zone A	Interwell	10A		15A	
	Zone B	Interwell	10B		15B	
	Zone C	Interwell	10C		Well E	
M-3 thru M-7	Zone A	Interwell	10A	34A, 35A[2]	15A	36A, 37A
	Zone B	Interwell	10B	34B, 35B[2]	15B	36B, 37B
	Zone C	Interwell	10C	34C, 35C[2]		36C,37C
M-10, M-11	Zone A	Interwell		38A, 39A	17A	
	Zone B	Interwell		38B, 39B	17B	

[1] Refers to statistical approach used for Detection Monitoring.
[2] Background data from these wells to be pooled for Detection Monitoring purposes.

2. Monitoring Schedule

The analytes and frequency of groundwater monitoring is as follows:

TABLE III.C.3
GROUNDWATER DETECTION MONITORING PROGRAM

Parameter	Units	Frequency
Field Parameters		
pH	pH units	Semi-annually
Specific Conductance	mhos/cm	Semi-annually
Temperature	°C	Semi-annually
Turbidity	Turbidity units	Semi-annually
Monitoring Parameters		
Total Dissolved Solids (TDS)	mg/L	Semi-annually
Chlorides	mg/L	Semi-annually
Sulfates	mg/L	Semi-annually
Nitrate - Nitrogen	mg/L	Semi-annually
Volatile Organic Compounds	ug/L	Semi-annually
Constituents of Concern		
Table II.B constituents	ug/L	Every 5 years

D. SURFACE WATER MONITORING

1. Monitoring Locations

The intermittent stream flowing into Deer Creek shall be sampled upstream and downstream of the waste management facility at the locations where the stream enters and leaves the facility boundary, or at locations pursuant to applicable NPDES permits for storm water or surface water discharge. These locations, SW-1 and SW-2 as shown in Attachment B, constitute the point of compliance for surface waters for all landfill units.

New or additional surface water sampling locations may be established as needed upon completion of new modules.

2. Monitoring Schedule

Surface water monitoring shall be conducted as specified in Table III.D.1 below. Sampling shall begin with the first surface runoff in the fall of each year and continue quarterly until surface runoff ceases in the dry season.

TABLE III.D.1
SURFACE WATER MONITORING PROGRAM

Parameter	Units	Frequency
Field Parameters		
Dissolved Oxygen	mg/L	Quarterly
Hardness (as $CaC0_3$)	mg/L	Quarterly
pH	pH units	Quarterly
Specific Conductance	mhos/cm	Quarterly
Turbidity	Turbidity Units	Quarterly
Monitoring Parameters		
Total Dissolved Solids (TDS)	mg/L	Quarterly
Bicarbonate	mg/L	Quarterly
Chlorides	mg/L	Quarterly
Sulfates	mg/L	Quarterly
Nitrate - Nitrogen	mg/L	Quarterly
Constituents of Concern		
Carbonate	mg/L	Annually
Chemical Oxygen Demand (COD)	mg/L	Annually
Total Organic Carbon (TOC)	mg/L	Annually
Table II.B constituents	ug/L	Every 5 years

The Discharger shall determine at each sampling whether there is a statistically significant increase over water quality protection standards for each parameter and constituent analyzed. If a release is detected at the downstream sampling point, the Discharger shall proceed with an Evaluation Monitoring Program to determine the source(s) and extent of the release.

IV. CORRECTIVE ACTION

A. GROUNDWATER EXTRACTION

The groundwater extraction well network, shown in Attachment D, is as follows:

TABLE IV.A.1
GROUNDWATER EXTRACTION WELLS

Module	Aquifer	Extraction Wells	
		Existing	Planned [2]
M1, M1-L	Zone A	EWs-1 through 8, and EWs 11 & 12	EW-9[1], 10, 13, 14
	Zone B	none	-----
	Zone C	none	-----

[1]
[2] To be converted from existing monitoring well MW-23A.
Expected to be operational in Summer 1999.

The following information shall be gathered annually as to the progress of groundwater remediation and reported in the format of Table IV.A.2 below:

TABLE IV.A.2
Mass of Total VOCs (lbs)

Aquifer Zone	Original Amount In Place	Amount Removed During Year	Cumulative Amount Removed	Amount Left In Place
A				
B				
C				

The information shall be included in the Annual Monitoring Report and/or the monitoring report for the second half of each year per the monitoring program.

B. CORRECTIVE ACTION MONITORING

1. Monitoring Locations

The corrective action monitoring points for Landfill 1 (including M1 and M1-L), shown in Attachment D, are as follows:

TABLE IV.B.1
CORRECTIVE ACTION MONITORING LOCATIONS

Aquifer[1]	Source Area	Downgradient Wells
Zone A	Landfill 1, M1	1A, 2A, 2A1, 3A, 4A, 5A, 6A, 6A1, 7AR, 9A, 11A, 16A, 18A, 19A, 20A, 21A, 22A, 23A, 29A
Zone B[1]	Landfill 1, M1	1B, 2B, 4B, 5B, 7B, 9B, 11B, 16B, 20B, 22B
Zone C[2]	Landfill 1, M1	2C

[1]
[2] List includes former detection monitoring wells impacted by the spread of contaminants.
Additional "C" zone well(s) may be needed.

2. Monitoring Schedule

The monitoring schedule for the corrective action wells is as follows:

TABLE IV.B.2
CORRECTIVE ACTION MONITORING PROGRAM

Parameter	Units	Frequency
Field Parameters		
pH	pH units	Semi-annually
Specific Conductance	mhos/cm	Semi-annually
Temperature	°C	Semi-annually
Turbidity	Turbidity units	Semi-annually
Monitoring Parameters		
Total Dissolved Solids (TDS)	mg/L	Semi-annually
Chlorides	mg/L	Semi-annually
Sulfates	mg/L	Semi-annually
Nitrate - Nitrogen	mg/L	Semi-annually
Volatile Organic Compounds	ug/L	Semi-annually
Constituents of Concern		
Table II.B constituents	ug/L	Annually

V. WATER QUALITY PROTECTION STANDARD

The Water Quality Protection Standard (Standard) consists of the following elements:

A. Constituents of Concern;
B. Concentration Limits;
C. Monitoring Points;
D. Points of Compliance; and
E. Compliance Period.

Each of these is described as follows:

A. Constituents of Concern

The Constituents of Concern (COCs) required under Section 20395 of Title 27 shall include all constituent groups identified in Table II.B and specifically listed in Attachment E. The Discharger shall monitor all COCs every five years or more frequently as required under the corrective action monitoring program.

B. Concentration Limits

1. General

The Concentration Limit for any given Constituent of Concern or Monitoring Parameter in a given monitored medium (i.e., the uppermost aquifer) at a landfill shall be as follows, and

shall be used as the basis of comparison with data from the Monitoring Points in that monitored medium:

a. The background value established in the WDRs by the Board for that constituent and medium;

b. The constituent's background value, established anew during each Reporting Period using only data from all samples collected during that Reporting Period from the Background Monitoring Points for that monitored medium. Either:

(1) The mean (or median, as appropriate) and standard deviation (or other measure of central tendency, as appropriate) of the constituent's background data; or

(2) The constituent's MDL, in cases where less than 10 percent of the background samples exceed the constituent's MDL; or

c. A concentration limit greater than background, as approved by the Board for use during or after corrective action.

2. **Unsaturated Zone** - background values established by monitoring

3. **Groundwater** - background values established by monitoring

4. **Surface Water** - Concentration limits for SW-2 shall be the upper tolerance limits calculated for this background monitoring point.

These values, and the statistical methods upon which they are based, are subject to ongoing review and approval by Board staff. In addition, they shall be updated as necessary to provide ongoing definition of background water quality.

C. Monitoring Points

1. **Unsaturated Zone** - As listed in Tables III.B.1 and III.B.2 for Units 1 and 2, respectively.

2. **Groundwater** - As listed in Tables III.C.1 and III.C.2 for Units 1 and 2, respectively.

3. **Surface Water** - As described in Section III.D.

Upon confirmation of an exceedence from an existing release, the Discharger shall transfer the impacted monitoring point(s) from the Detection Monitoring Program (DMP) to the Corrective Action Monitoring Program (CAMP). Upon confirmation that levels in a previously impacted monitoring point has been reduced below concentration limits, the Discharger may, with Board staff approval, transfer that monitoring point from the CAMP to the DMP.

D. Points of Compliance

The point(s) of compliance at each groundwater monitoring point is the vertical surface located at the downgradient limit of the WMU that extends through the uppermost aquifer underlying the WMU. These points correspond to the corrective action wells on the southern and southwestern

periphery of the landfill along Kiefer Road. The point of compliance for surface water monitoring shall be SW-2.

E. Compliance Period

The Compliance Period is the number of years equal to the active life of the landfill plus the closure period. Each time the Standard is exceeded (i.e., a release is discovered), the landfill begins a Compliance Period on the date the Board directs the Discharger to begin an Evaluation Monitoring Program. If the Discharger's Corrective Action Program has not achieved compliance with the Standard by the scheduled end of the Compliance Period, the Compliance Period is automatically extended until the landfill has been in continuous compliance for at least three consecutive years.

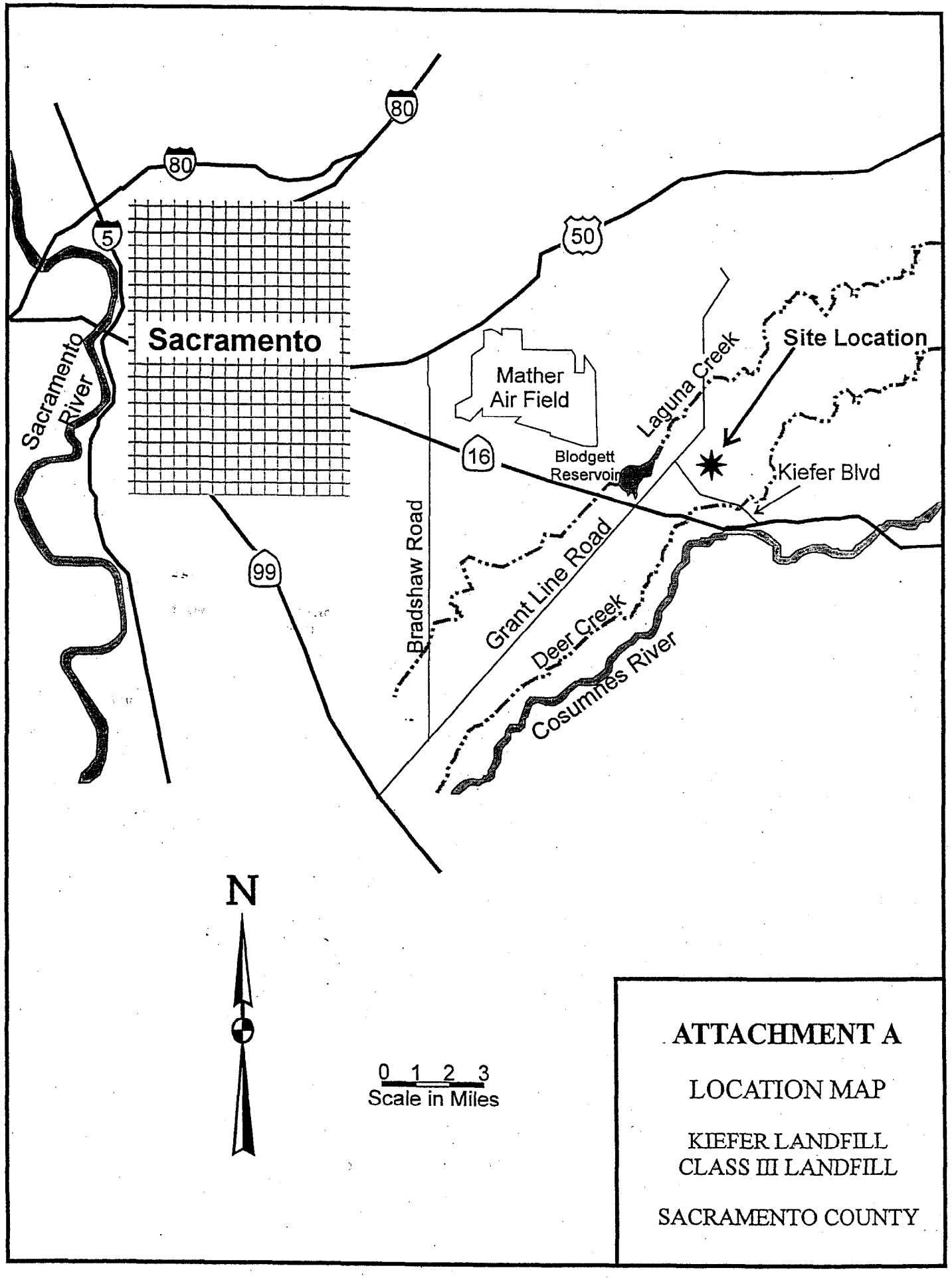
The Discharger shall implement the above monitoring program on the effective date of this Order.

Ordered by:

GARY M. CARLTON, Executive Officer

30 April 1999
(Date)

JDM:dlk

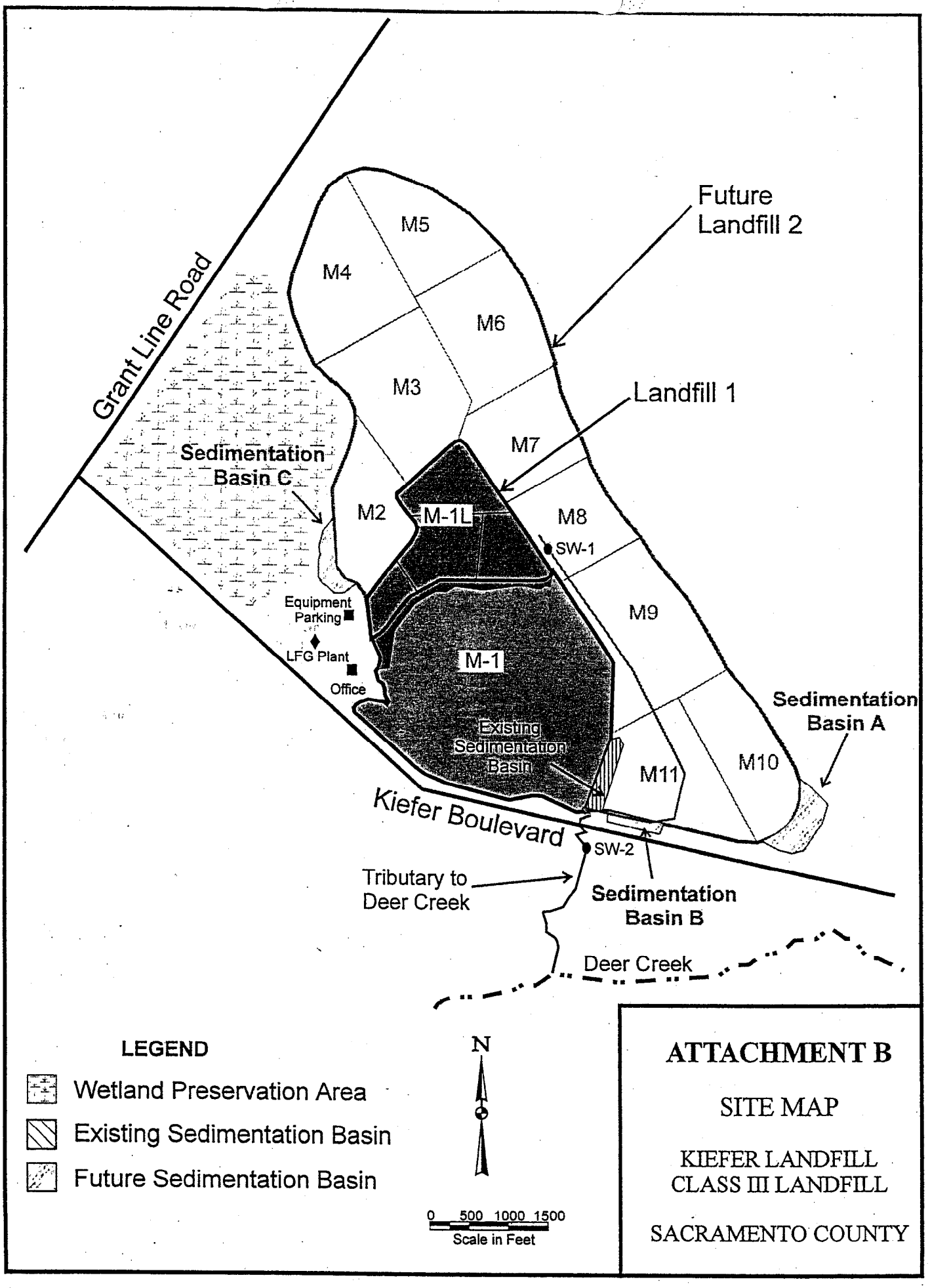


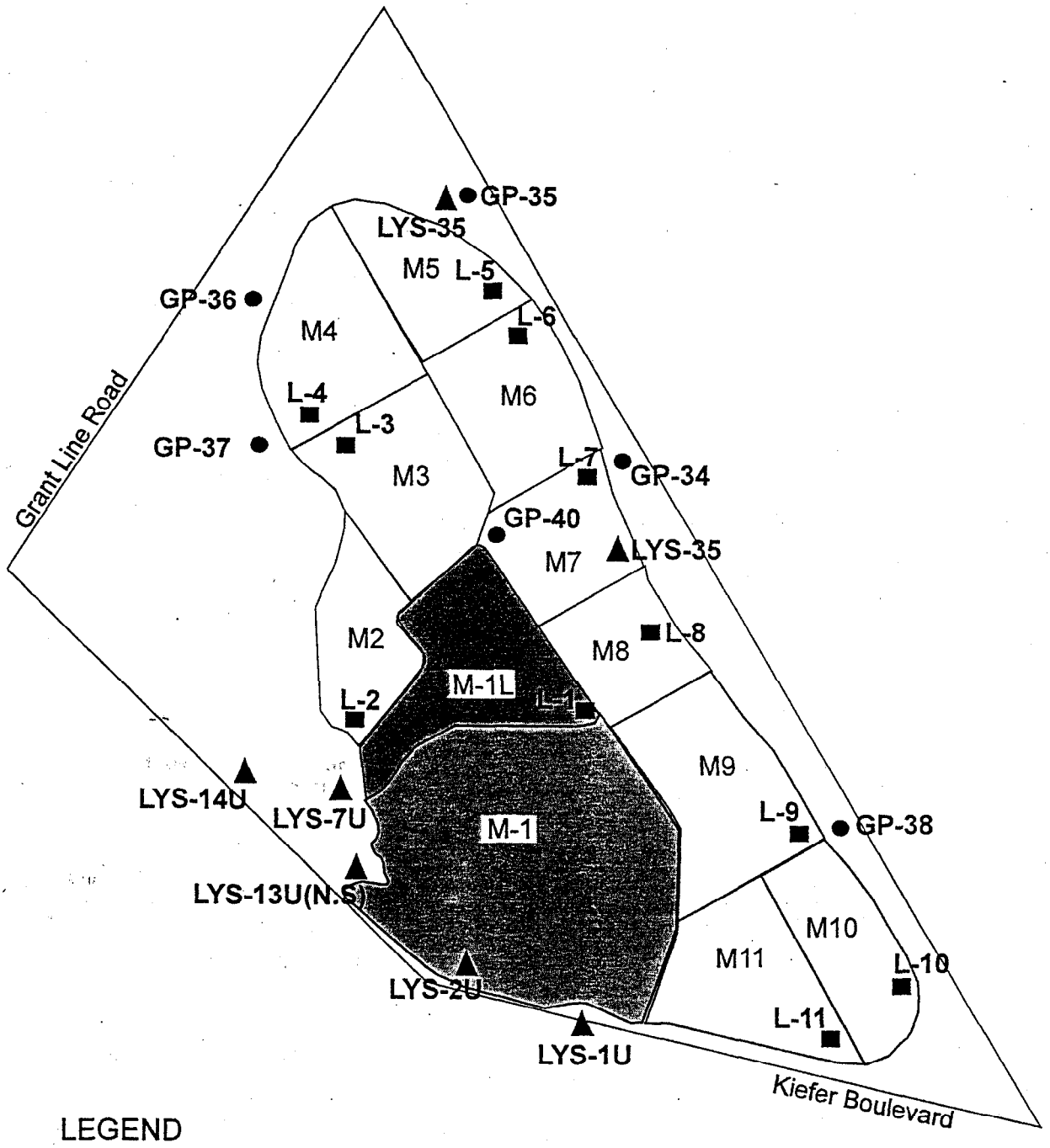
ATTACHMENT A

LOCATION MAP

KIEFER LANDFILL
CLASS III LANDFILL

SACRAMENTO COUNTY


Grant Line Road
Future
Landfill 2
M5
M4
M6
M3
Landfill 1
M7
Sedimentation
Basin C
M2
M-1L
M8
SW-1
Equipment
Parking
M9
LFG Plant
M-1
Office
Sedimentation
Basin A
Existing
Sedimentation
Basin
M11
M10
Kiefer Boulevard
SW-2
Tributary to
Deer Creek
Sedimentation
Basin B
Deer Creek
LEGEND
Wetland Preservation Area
Existing Sedimentation Basin
Future Sedimentation Basin
N
0 500 1000 1500
Scale in Feet
ATTACHMENT B
SITE MAP
KIEFER LANDFILL
CLASS III LANDFILL
SACRAMENTO COUNTY



LEGEND

- ▲ Lysimeter
- ■ Leachate Sump
- ● LF-2 Gas Monitoring Probes/Wells

N

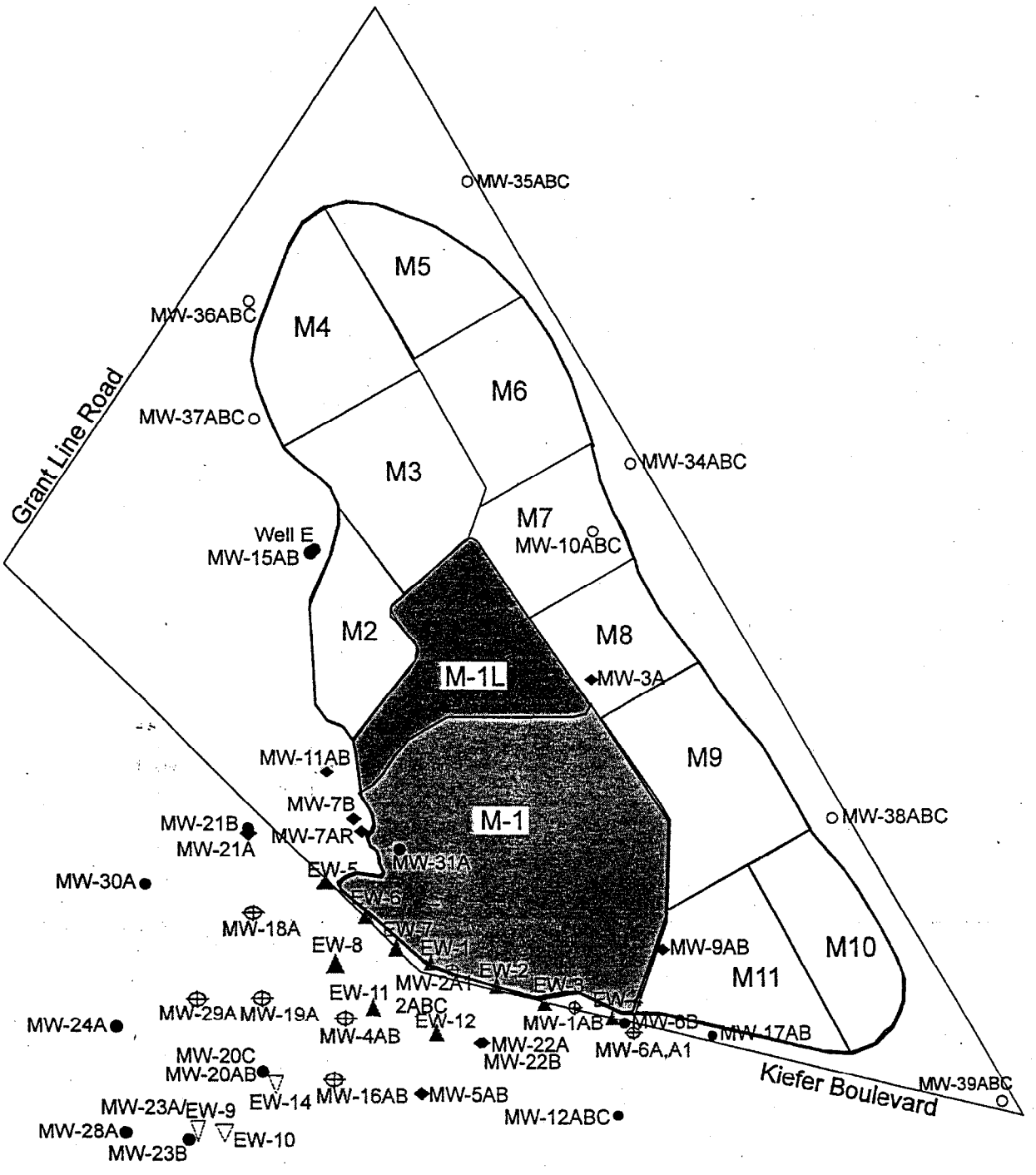
500 0 500 1000
Scale in Feet

ATTACHMENT C

VADOSE ZONE
MONITORING NETWORK

KIEFER LANDFILL
CLASS III LANDFILL

SACRAMENTO COUNTY



MW-27A

LEGEND

- ○ Proposed Detection Monitoring Well
- ● Existing Detection Monitoring Well
- ◆ Annual Monitoring Well
- ⊕ Corrective Action Monitoring Well
- ▲ Existing Groundwater Extraction Well
- ▽ Proposed Groundwater Extraction Well

N

500 0 500 1000
Scale in Feet

ATTACHMENT D

GROUNDWATER MONITORING WELL MAP

KIEFER LANDFILL
CLASS III LANDFILL

SACRAMENTO COUNTY

Attachment E

CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS

Inorganics (by USEPA Method):[1]

Aluminum	6010
Antimony	6010
Barium	6010
Beryllium	6010
Cadmium	6010
Chromium	6010
Chromium VI	7197
Cobalt	6010
Copper	6010
Iron	6010
Manganese	6010
Silver	6010
Tin	6010
Vanadium	6010
Zinc	6010
Arsenic	7061
Lead	7421
Mercury	7470
Nickel	7520
Selenium	7741
Thallium	7841
Cyanide	9010
Sulfide	9030

[1] Report all peaks identified by the EPA test methods. Ground water and leachate samples shall be analyzed and reported as dissolved. Surface water samples shall be analyzed and reported as total recoverable metals as specified in EPA-600/4-79-020 dated March 1993. Unsaturated zone water samples shall be analyzed and reported as totals.

Volatile Organics (USEPA Method 8260):

Acetone
Acetonitrile (Methyl cyanide) Acrolein
Acrylonitrile
Allyl chloride (3-Chloropropene) Benzene
Bis(2-ethylhexyl) phthalate
Bromochloromethane (Chlorobromomethane)

Attachment E (continued)

Bromodichloromethane (Dibromochloromethane)
Bromoform (Tribromomethane)
Carbon disulfide
Carbon tetrachloride
Chlorobenzene
Chloroethane (Ethyl chloride)
Chloroform (Trichloromethane)
Chloroprene
Dibromochloromethane (Chlorodibromomethane)
1,2-Dibromo-3-chloropropane (DBCP)
1,2-Dibromoethane (Ethylene dribromide; EDB)
o-Dichlorobenzene (1,2-Dichlorobenzene)
m-Dichlorobenzene (1,3-Dichlorobenzene)
p-Dichlorobenzene (1,4-Dichlorobenzene)
trans- 1,4-Dichloro-2-butene
Dichlorodifluoromethane (CFC 12)
1,1-Dichloroethane (Ethylidene chloride)
1,2-Dichloroethane (Ethylene dichloride)
1,1-Dichloroethylene (1,1-Dichloroethene; Vinylidene chloride)
cis- 1,2-Dichloroethylene (cis- 1,2-Dichloroethene)
trans- 1,2-Dichloroethylene (trans- 1,2-Dichloroethene)
1,2-Dichloropropane (Propylene dichloride)
1,3-Dichloropropane (Trimethylene dichloride)
2,2-Dichloropropane (Isopropylidene chloride)
1,1 -Dichloropropene
cis- 1 ,3-Dichloropropene
trans- 1,3-Dichloropropene
Ethylbenzene
Hexachlorobutadiene
2-Hexanone (Methyl butyl ketone)
Isobutyl alcohol
Isodrin
Methacrylonitrile
Methyl bromide (Bromomethane)
Methyl chloride (Chloromethane)
Methyl ethyl ketone (MEK; 2-Butanone)
Methyl iodide (Iodomethane)
Methyl methacrylate
Methyl tert butyl ether (MTBE)
4-Methyl-2-pentanone (Methyl isobutyl ketone)
Methylene bromide (Dibromomethane)

Attachment E (continued)

Methylene chloride (Dichloromethane)
Naphthalene
Propionitrile (Ethyl cyanide)
Styrene
1,1,1,2-Tetrachloroethane
1,1,2,2-Tetrachloroethane
Tetrachloroethylene (Tetrachloroethene; Perchloroethylene; PCE)
Toluene
1,2,4-Trichlorobenzene
1,1,1-Trichloroethane, Methylchloroform
1,1,2-Trichloroethane
Trichloroethylene (Trichloroethene; TCE)
Trichlorofluoromethane (CFC- 11)
1,2,3-Trichloropropane
Vinyl acetate
Vinyl chloride (Chloroethene)
Xylene (total)

Semivolatile Organics (USEPA Method 8270 - base, neutral, & acid extractables):

Acenaphthene
Acenaphthylene
Acetophenone
2-Acetylaminofluorene (2-AAF)
Aldrin
4-Aminobiphenyl
Anthracene
Benzo[a]anthracene (Benzanthracene)
Benzo[b]fluoranthene
Benzo[k]fluoranthene
Benzo[g,h,i]perylene
Benzo[a]pyrene
Benzyl alcohol
alpha-BHC
beta-BHC
delta-BHC
gamma-BHC (Lindane)
Bis(2-chloroethoxy)methane
Bis(2-chloroethyl) ether (Dichloroethyl ether)
Bis(2-chloro-1-methyethyl) ether (Bis(2-chloroisopropyl) ether; DCIP)
4-Bromophenyl phenyl ether

Attachment E (continued)

Butyl benzyl phthalate (Benzyl butyl phthalate)
Chlordane
p-Chloroaniline
Chlorobenzilate
p-Chloro-m-cresol (4-Chloro-3-methylphenol)
2-Chloronaphthalene
2-Chlorophenol
4-Chlorophenyl phenyl ether
Chrysene o-Cresol (2-methylphenol)
m-Cresol (3-methylphenol)
p-Cresol (4-methylphenol)
4,4'-DDD
4,4'-DDE
4,4'-DDT
Diallate
Dibenz[a,h]anthracene
Dibenzofuran
Di-n-butyl phthalate
o-Dichlorobenzene (1,2-Dichlorobenzene)
m-Dichlorobenzene (1,3-Dichlorobenzene)
p-Dichlorobenzene (1,4-Dichlorobenzene)
3,3'-Dichlorobenzidine
2,4-Dichlorophenol
2,6-Dichlorophenol
Dieldrin
Diethyl phthalate
p-(Dimethylamino)azobenzene
7,12-Dimethylbenz[a]anthracene
3,3'-Dimethylbenzidine
2,4-Dimehtylphenol (m-Xylenol)
Dimethyl phthalate
m-Dinitrobenzene
4,6-Dinitro-o-cresol (4,6-Dinitro-2-methylphenol)
2,4-Dinitrophenol
2,4-Dinitrotoluene
2,6-Dinitrotoluene
Di-n-octyl phthalate
Diphenylamine
Endosulfan I
Endosulfan II

Attachment E (continued)

Endosulfan sulfate
Endrin
Endrin aldehyde
Ethyl methacrylate
Ethyl methanesulfonate
Famphur
Fluoranthene
Fluorene
Heptachlor
Heptachlor epoxide
Hexachlorobenzene
Hexachlorobutadiene
Hexachlorocyclopentadiene
Hexachloroethane
Hexachloropropene
Indeno(1,2,3-c,d)pyrene
Isophorone
Isosafrole
Kepone
Methapyrilene
Methoxychlor
3-Methylcholanthrene
Methyl methanesulfonate
2-Methylnaphthalene
Naphthalene
1,4-Naphthoquinone
1-Naphthylamine
2-Naphthylamine
o-Nitroaniline (2-Nitroaniline)
m-Nitroaniline (3-Nitroaniline)
p-Nitroaniline (4-Nitroaniline)
Nitrobenzene
o-Nitrophenol (2-Nitrophenol)
p-Nitrophenol (4-Nitrophenol)
N-Nitrosodi-n-butylamine (Di-n-butylnitrosamine)
N-Nitrosodiethylamine (Diethylnitrosamine)
N-Nitrosodimethylamine (Dimethylnitrosamine)
N-Nitrosodiphenylamine (Diphenylnitrosamine)
N-Nitrosodipropylamine (N-Nitroso-N-dipropylamine; Di-n-propylnitrosamine)
N-Nitrosomethylethylamine (Methylethylnitrosamine)

Attachment E (continued)

N-Nitrosopiperidine
N-Nitrosospyrrolidine
5-Nitro-o-toluidine
Pentachlorobenzene
Pentachloronitrobenzene (PCNB)
Pentachlorophenol
Phenacetin
Phenanthrene
Phenol
p-Phenylenediamine
Polychlorinated biphenyls (PCBs; Aroclors)
Pronamide
Pyrene
Safrole
1,2,4,5-Tetrachlorobenzene
2,3,4,6-Tetrachlorophenol
o-Toluidine
Toxaphene
1,2,4-Trichlorobenzene
2,4,5-Trichlorophenol
2,4,6-Trichlorophenol
0,0,0-Triethyl phosphorothioate
sym-Trinitrobenzene

Organophosphorus Compounds (USEPA Method 8140):

0,0-Diethyl 0-2-pyrazinyl phosphorothioate (Thionazin)
Dimethoate
Disulfoton
Methyl parathion (Parathion methyl)
Parathion
Phorate

Chlorinated Herbicides (USEPA Method 8150):

2,4-D (2,4-Dichlorophenoxyacetic acid)
Dinoseb (DNBP; 2-sec-Butyl-4,6-dinitrophenol)
Silvex (2,4,5-Trichlorophenoxypropionic acid; 2,4,5-TP)
2,4,5-T (2,4,5-Trichlorophenoxyacetic acid)

Attachment F

MONITORING PARAMETERS FOR DETECTION MONITORING

Surrogates for Metallic Constituents:

pH
Total Dissolved Solids
Specific Conductivity
Chloride
Sulfate
Nitrate nitrogen

Constituents included in VOC_{water} (by USEPA Method 8260):

Acetone
Acrylonitrile
Benzene
Bromochloromethane
Bromodichloromethane
Bromoform (Tribromomethane)
Carbon disulfide
Carbon tetrachloride
Chlorobenzene
Chloroethane (Ethyl chloride)
Chloroform (Trichloromethane)
Dibromochloromethane (Chlorodibromomethane)
1,2-Dibromo-3-chloropropane (DBCP)
1,2-Dibromoethane (Ethylene dibromide; EDB)
o-Dichlorobenzene (1,2-Dichlorobenzene)
p-Dichlorobenzene (1,4-Dichlorobenzene)
trans- 1,4-Dichloro-2-butene
1,1-Dichloroethane (Ethylidene chloride)
1,2-Dichloroethane (Ethylene dichloride)
1,1-Dichloroethylene (1,1-Dichloroethene; Vinylidene chloride)
cis-1,2-Dichloroethylene (cis- 1,2-Dichloroethene)
trans-1,2-Dichloroethylene (trans-1,2-Dichloroethene)
1,2-Dichloropropane (Propylene dichloride)
cis-1,3-Dichloropropene

Attachment F (continued)

trans-1,3-Dichloropropene
Ethylbenzene
2-Hexanone (Methyl butyl ketone)
Methyl bromide (Bromomethene)
Methyl chloride (Chloromethane)
Methylene bromide (Dibromomethane)
Methylene chloride (Dichloromethane)
Methyl ethyl ketone (MEK; 2-Butanone)
Methyl iodide (Iodomethane)
Methyl tert butyl ether (MTBE)
4-Methyl-2-pentanone (Methyl isobutylketone)
Styrene
1,1,1,2-Tetrachloroethane
1,1,2,2-Tetrachloroethane
Tetrachloroethylene (Tetrachloroethene; Perchloroethylene)
Toluene
1,1,1-Trichloethane (Methylchloroform)
1,1,2-Trichloroethane
Trichloroethylene (Trichloroethene)
Trichlorofluoromethane (CFC-11)
1,2,3-Trichloropropane
Vinyl acetate
Vinyl chloride
Xylenes

INFORMATION SHEET

ORDER NO. 99-053
COUNTY OF SACRAMENTO, PUBLIC WORKS AGENCY
KIEFER LANDFILL
SACRAMENTO COUNTY

The Kiefer Landfill is a Class III municipal solid waste (MSW) disposal facility operated by the County of Sacramento, Public Works Agency (Discharger) since its start-up 1967. It is at the intersection of Grant Line Road and Kiefer Boulevard, in the eastern portion of Sacramento County, about 15 miles east of the City of Sacramento, 1 mile north of Sloughhouse. The landfill accepts approximately 950,000 tons per year of MSW from the Cities of Sacramento, Folsom, Isleton, Galt, and unincorporated areas. Current waste disposal is to Landfill 1, which is only partially lined and has a 228-acre footprint.

At current disposal rates, the landfill will reach full capacity in three years. The Discharger is therefore, planning to expand the facility and has applied for revised WDRs to allow for waste disposal at Landfill 2, a 432-acre expansion of the facility to be constructed in phases immediately north of the existing landfill. Previous WDR Order No. 95-078 did not cover the proposed expansion area. It is estimated that Landfill 2 will extend the life of the landfill to the year 2035. The revised WDRs include requirements for both landfills and limit the disposal to inert, nonhazardous and special wastes.

Several aquifers of drinking water quality underlie the site, including the Laguna, Upper Mehrten, Lower Mehrten, and Valley Springs Formations, which are part of the extensive ground water aquifer underlying the Sacramento Valley. In 1989, a significant release of volatile organic compounds (VOC) and inorganic constituents from the landfill was detected in the upper zones of the Upper Mehrten during a Solid Waste Assessment Test (SWAT). In 1991, the Board issued Cleanup and Abatement Order No. 91-725 (CAO), requiring the Discharger to develop a Corrective Action Plan, and in April 1995 the Discharger initiated ground water extraction and treatment of VOCs. The treatment system includes two air stripper towers, a carbon absorption filter, and several extraction wells, and discharges to Deer Creek under NPDES permit. The Discharger has also initiated landfill gas extraction. Recent monitoring results indicate that the extent and levels of VOCs in the ground water have been significantly reduced.

Natural surface water drainage is to Laguna Creek to the north, thence to the Sacramento River, and to Deer Creek to the South, tributary to the Cosumnes River, thence the Mokelumne River. On-site diversionary structures direct storm water to the southern part of the site, however, where it is contained and periodically discharged to Deer Creek.

The landfill expansion will impact 4.8 acres of on-site wetlands. To meet the requirements of Subtitle D, the Discharger will be implementing a Wetlands Mitigation and Monitoring program to mitigate the impact of the project on wetlands and certain threatened or endangered species.

30 April 1999
JDM